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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/501,240

03/30/2005

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TS1175US

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7590

11/15/2007

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EXAMINER

WU, IVES J

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

11/15/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

Application No.

10/501,240

Applicant(s)

BROK ET AL.

Examiner

Ives Wu

Art Unit

1797

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 7/12/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

**Claim 14** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 14, it recites: in which process the loaded solvent is flashed at a pressure between 1 and 1 bara. It is unclear for the range of pressure as claimed, either a fixed pressure or a range.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1-6,15-18** are rejected under 35 U.S.C. 102(b) as being anticipated by Schubert et al (US06337059B1).

As to 15 to 40 parts by wt based on total solution of sulfolane, in a process for the removal of carbon dioxide from a gas stream containing carbon dioxide by washing the gas with an aqueous washing solution in **independent claim 1**, Schubert et al (US06337059B1) disclose the absorbent composition for the removal of acid gases, may optionally also comprising one or other chemical solvents or physical solvents. Physical solvent such as sulfolane is used (Col. 2, line 39-40). When such chemical or physical solvents are used, they preferably make up from about 5 to about 50 wt% of the absorbent composition (Col. 2, line 32-44).

As to 30 to 60 parts by wt based on total solution of a secondary or tertiary amine derived from ethanol amine in a process for the removal of carbon dioxide from a gas stream containing carbon dioxide by washing the gas with an aqueous washing solution in **independent claim 1**, Schubert et al (US06337059B1) disclose the amount of MDEA in aqueous solution ranged from

about 1.5 to about 6 moles (M. W. of MDEA = 130) per liter of aqueous solution (Col. 2, line 25-27), which reads on the limitation of instant claim. Additional chemical solvents, for example, amines such as diethanolamine (DEA), diisopropanolamine (DIPA) (Col. 2, line 39-40), when such chemical or physical solvents are used, they preferably make up from about 5 to about 50 wt% of the absorbent composition (Col. 2, line 32-44).

As to in the presence of primary or secondary amine compound in an amount between 0.5 and 15 wt% based on water, sulfolane and amine in a process for the removal of carbon dioxide from a gas stream containing carbon dioxide by washing the gas with an aqueous washing solution in **independent claim 1**, Schubert et al (US06337059B1) disclose, preferably, the amount of piperazine (2<sup>nd</sup> amine) to be greater than about 1.1 mole per liter of aqueous solution (Col. 2, line 21-22), which reads on the limitation of instant claim. Additional chemical solvents, for example, amines such as monoethanolamine (primary amine), diethanolamine (DEA), diisopropanolamine (DIPA) (Col. 2, line 39-40), when such chemical or physical solvents are used, they preferably make up from about 5 to about 50 wt% of the absorbent composition (Col. 2, line 32-44).

As to 15 to 45 parts by wt based on total solution of water in a process for the removal of carbon dioxide from a gas stream containing carbon dioxide by washing the gas with an aqueous washing solution in **independent claim 1**, Schubert et al (US06337059B1) disclose an absorbent composition for removal of acid gases, such as CO<sub>2</sub>, H<sub>2</sub>S and COS from gas stream (Title). The balance of absorbent composition may be water (Col. 2, line 31), which reads on the limitation of instant claim.

As to gas stream to be a natural gas or synthesis gas in **claim 2**, Schubert et al (US06337059B1) disclose, for example, natural gas wells, synthesis gas streams and refinery gas (Col. 2, line 52-54).

As to amount of carbon dioxide to be between 1 and 45 mol%, the amount of hydrogen sulphide to be between 0 to 25 mol%, amount of COS to be between 0 and 2 mol% in **claim 3**, Schubert et al (US06337059B1) disclose up to about 90 mol% of H<sub>2</sub>S to be present as well. CO<sub>2</sub> is typically present in amounts ranging up to about 50 mol%, often from about 1 to 15 mol%, COS, when present, typically comprises from about 2 to 10,000 ppmv (Col. 2, line 63-67).

As to amount of water to be between 20 to 45 parts by wt, the amount of sulfolane to be between 20 and 35 parts by wt, and the amount of amine to be between 40 and 55 parts by wt, the amounts of water, sulfolane and amine together being 100 parts by wt in **claim 4**, Schubert et al (US06337059B1) disclose the absorbent composition comprising an aqueous solution of piperazine and MDEA. The amount of piperazine in the aqueous solution must be greater than 1 mole per liter of aqueous solution (Col. 2, line 17-20). The amount of MDEA in the aqueous solution ranges from about 1.5 to 6 moles per liter of aqueous solution (Col. 2, line 25-27). The balance of the absorbent composition may be water, or the optionally also comprise one or more other chemical solvents or physical solvents. For example, amines, such as triethanolamine (tertiary amine), diethanolamine (DEA), monoethanolamine (primary amine) or diisopropanolamine (DIPA) may be used as additional chemical solvents. Physical solvents such as sulfolane or methoxytriglycol may also be employed. When such chemical or physical solvents are used, they preferably make up from about 5 to about 50 wt% of the absorbent composition (Col. 2, line 31-45), which reads on the limitation of instant claim.

As to secondary amine derived from ethanolamine to be DIPA, DEA or MMEA in **claim 5**, Schubert et al (US06337059B1) disclose DIPA, DEA (Col.2, line 36-38).

As to tertiary amine derived from ethanolamine to be MDEA or DEMEA in **claim 6**, Schubert et al (US06337059B1) disclose MDEA (Abstract, line 5-6).

As to the absorbent liquid composition in **independent claim 15**, the disclosure of Schubert et al is incorporated herein by reference, the most subject matters as currently claimed, have been recited in applicants' claim 1, and have been discussed therein.

As to the limitations of **claims 16 - 18**, the disclosure of Schubert et al is incorporated herein by reference, the most subject matters as currently claimed, have been recited in applicants' claims 4-6, and have been discussed therein.

### ***Claim Rejections - 35 USC § 102/103***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

**Claims 7- 14, 19 - 22** are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Schubert et al (US06337059B1).

As to primary amine or secondary amine compound having a  $pK_b$  below 5 in **claim 7**, and primary or secondary amine compound reacting at least twice as fast with carbon dioxide than the amine reacting with carbon dioxide in **claim 8**, in view of the substantially identical primary amine and secondary amine disclosed by prior art, and by applicants, it is examiner's position to believe that the primary or secondary amine compound of prior art would inherently possess the  $pK_b$  below 5 and reaction rate as claimed. The burden now is shifted to applicants to prove otherwise. *In re Fitzgerald*, 205 USPQ 594 (CCPA 1980).

As to primary or secondary amine compound being piperazine, methyl ethanol amine, or (2-aminoethyl) ethanol amine in **claim 9**, Schubert et al (US06337059B1) disclose piperazine (Abstract, line 4).

As to amount of primary or secondary amine compound being between 2.5 and 10 wt% in **claims 10 and 11**, Schubert et al (US06337059B1) disclose piperazine to be greater than 1 mole/liter (Abstract, line 4-5), which reads on the limitation of claims.

As to process being carried out at a temperature of at least 20 °C in **claim 12**, Schubert et al (US06337059B1) disclose the absorption zone typically operated at a temperature of about 25 to 90 °C (Col. 3, line 18-20).

As to process also comprising a regeneration of the loaded solvent in **claim 13**, Schubert et al (US06337059B1) disclose regeneration zone (Col. 3, line 37).

As to process to be carried out at a pressure between 25 to 90 bara and to be flashed at a pressure 1 and 15 bara, followed by regeneration at a pressure between 1 and 2 bara in **claim 14**, Schubert et al (US06337059B1) disclose the absorption zone to be at pressure of about 15 to 1500 psia (Col. 3, line 18-20). Regeneration zone is typically operated at a temperature of about 15 to 50 psia (Col. 3, line 44-46). In absence of showing the criticality of the records, the optimization for the pressure in the flashing device being 1 and 15 bara in a known process render prima facie obviousness within one of ordinary skills in the art. In re Boesch, 617 F.2d 272, 276, 205 USPQ 215, 219 (CCPA 1980).

As to limitation of **claims 19 - 22**, the disclosure of Schubert et al is incorporated herein by reference, the most subject matters as currently claimed, have been recited in applicants' claims 7, 9, 10 and 11 respectively, and have been discussed them therein.

### Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ives Wu whose telephone number is 571-272-4245. The examiner can normally be reached on 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Duane Smith can be reached on 571-272-1166. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Examiner: Ives Wu

Art Unit: 1797

Date: November 9, 2007

DUANE SMITH  
PRIMARY EXAMINER

11-9-07